AMENDMENTS TO THE CLAIMS

1. (previously presented): A method for identifying compounds that modulate a target protein, comprising:

providing cells transfected in such a way as to provide a polynucleotide sequence encoding said target under control of a heterologous inducible promoter;

inducing the promoter under conditions that provide a detectable change in a measurable parameter associated with the cells;

contacting at least a portion of the cells with a test compound to ascertain whether the test compound affects a change in the measurable parameter; and

repeating the contacting step with at least one other test compound.

2. (previously presented): The method of Claim 1, wherein the measurable parameter is a parameter other than growth or survival.

3. (previously presented): The method of Claim 1, wherein the contacting step comprises contacting cells with said test compound while the promoter is induced.

4. (previously presented): The method of Claim 1, further comprising comparing the value of the measurable parameter in uninduced cells with the value of the parameter in induced cells.

5. (previously presented): The method of Claim 4, wherein the measurable parameter has been selected from among a plurality of candidate parameters based on said comparison.

6. (previously presented): The method of Claim 1, wherein the promoter is induced to a degree that provides a detectable change in the parameter but not to a degree that kills the cell.

7. (previously presented): The method of Claim 1, wherein the promoter is induced by contacting the cell with an inducer molecule.

8. (previously presented): The method of Claim 1, wherein the promoter is induced by removal or inhibition of a repressor.

9. (previously presented): The method of Claim 1, wherein the target protein affects ion channel activity of the cell.

10. (previously presented): The method of Claim 9, wherein the target protein is an ion channel protein.

11. (previously presented): The method of Claim 9, further comprising:

identifying at least one test compound that modulates the measurable parameter in the cell;

providing a second cell line that differs from the first cell line in that the inducible promoter controls expression of a reporter instead of polynucleotide encoding target;

contacting the second cell line with the identified test compound; and

ascertaining whether the identified test compound affects the expression of the reporter.

12. (previously presented): The method of Claim 1, wherein said polynucleotide encoding target and said promoter have been transfected into a mammalian cell.

13. (previously presented): The method of Claim 1, wherein said inducible promoter replaces an endogenous promoter and controls the expression of an endogenous polynucleotide encoding target.

14. (previously presented): A method for identifying an ion channel modulator molecule comprising the steps of:

a. obtaining a cell that conditionally expresses an ion channel target;

b. incubating a potential ion channel modulator molecule with said cell; and

c. determining whether ion flow through said ion channel targets has modulated, thereby identifying molecules that modulate said ion channel target.

15. (previously presented): A method according to claim 14 wherein said cell that conditionally expresses said ion channel target has been induced to express said ion channel target.

16. (previously presented): A method according to claim 14 wherein said cell is selected from the group consisting of CHO, CHO-K1, HEK293, COS, Vero, SH-SY5Y, RBL and U20S.

17. (previously presented): A method according to claim 14 wherein the step of obtaining a cell that conditionally expresses an ion channel target comprises genetically adapting said cell to produce an ion channel target.

18. (previously presented): A method according to claim 17 wherein said cell is genetically adapted by transducing or transfecting said cell with an inducible vector comprising an ion channel target.

19. (previously presented): A method according to Claim 18 wherein said inducible vector comprises an inducible cassette wherein said inducible cassette comprises an inducible promoter, an ion channel gene, and a gene conferring resistance to a selection agent for selecting transfected cells wherein said inducible promoter is operably linked to said ion channel gene.

20. (previously presented): A method according to claim 19 wherein said inducible promoter is selected from the group consisting of the heat shock inducible promoter, metallothionin promoter, ecdysone-inducible promoter, FKBP dimerization inducible promoter, Gal4-estrogen receptor fusion protein regulated promoter, lac repressor, steroid inducible promoter, streptogramin responsive promoters and tetracycline regulated promoters.

21. (previously presented): A method according to claim 18 wherein said inducible vector may be activated to express said ion channel target and inactivated to prevent expression of said ion channel target.

22. (previously presented): A method according to claim 14 wherein said ion channel target is an ion channel selected from the group consisting of a sodium ion channel, an epithelial sodium channel, a chloride ion channel, a voltage-gated chloride ion channel, a potassium ion channel, a voltage-gated potassium ion channel, a calcium-activated potassium channel, an inwardly rectifying potassium channel, a calcium ion channel, a voltage-gated calcium ion channel, a ligand-gated calcium ion channel, a cylic-nucleotide gated ion channel, a hyperpolarization-activated cyclic-nucleotide gated channel, a water channel, a gap junction channel, a viral ion channel, an ATP-gated ion channel and a calcium permeable beta-amyloid peptide channel.

23. (previously presented): A method for identifying an ion channel modulator molecule, comprising the steps of:

a. obtaining a cell that conditionally expresses an ion channel target;

b. adding an inducer molecule that induces expression of said ion channel target in said cell;

c. measuring membrane potential of said cell;

d. incubating a potential ion channel modulator molecule with said cell;

e. measuring changes in membrane potential; and

f. determining whether ion flow through said ion channel targets has been modulated, thereby identifying a molecule that modulates said ion channel.

24. (previously presented): A method for screening chemical compounds to identify an ion channel modulator compound, comprising the steps of:

a. obtaining a cell that conditionally expresses an ion channel target;

b. adding an inducer molecule that induces expression of said ion channel target in said cell;

c. measuring membrane potential of said cell;

d. incubating said chemical compounds with said cell; and measuring changes in membrane potential;

e. determining whether ion flow through said ion channel targets has been modulated, thereby identifying compounds that modulate said ion channel target.

25. (previously presented): A method for identifying a membrane receptor modulator molecule comprising:

a. obtaining a cell that conditionally expresses a target membrane receptor;

b. inducing expression of said target membrane receptor;

c. measuring a physiological condition of said cell to obtain a first set of data;

d. incubating a potential membrane receptor modulator molecule with said cell;

e. measuring said physiological condition of said cell to obtain a second set of data; and

f. comparing said first set of data with said second set of data to determine whether said physiological condition of said cell has been modulated, thereby identifying a molecule that modulates said target membrane receptor.

26. (previously presented): A method according to claim 25 wherein the step of obtaining a cell that conditionally expresses said membrane receptor comprises:

a. obtaining a cell that contains an endogenous target membrane receptor sequence and an endogenous noncoding sequence; and

b. inserting an inducible cassette comprising a 5' insertion adapter, a regulatory sequence and a 3' insertion adapter within said endogenous noncoding sequence such that said regulatory sequence is operably linked such that it is able to modulate transcription of said target membrane receptor by the presence or absence of a regulator.

27. (previously presented): A method according to claim 26 wherein said regulatory sequence is a non-mammalian enhancer sequence or a repressor sequence.

28. (previously presented): A method according to claim 27 wherein said non-mammalian enhancer sequence is a herpes virus enhancer or an artificial enhancer.

29. (previously presented): A method according to claim 28 wherein said non-mammalian enhancer sequence is an inducible promoter.

30. (previously presented): A method according to claim 29 wherein said inducible promoter is a herpes virus promoter.

31. (previously presented): A method according to claim 29 wherein said inducible cassette further comprises a target sequence such that said target sequence is transcribed upon induction of said inducible cassette.

32. (previously presented): A method according to claim 31 wherein said target sequence is selected from the group consisting of a G-protein coupled receptor target sequence, a nuclear hormone receptor target sequence, a cytokine receptor target

sequence, a protein kinase-coupled receptor target sequence a nicotinic acetylcholine receptor target sequence, a ionotropic glutamate receptor target sequence, a glycine receptor target sequence, a gamma-aminobutyric acid receptor target sequence, and a vanilloid receptor target sequence.

33. (previously presented): A method according to claim 32 wherein said target sequence is 5HT4.

34. (previously presented): A method according to claim 27 wherein said repressor sequence is able to bind a zinc finger protein.

35. (previously presented): A method according to claim 34 wherein said zinc finger protein comprises a KRAB domain.

36. (previously presented): A method according to claim 26 wherein said regulator is VP16 or a functional domain of VP16.

37. (previously presented): A method according to Claim 25 further comprising transfecting said cell with a regulatory expression vector construct comprising a second inducible promoter and a regulator gene encoding said regulator operably linked such that induction of said second inducible promoter by an exogenous stimulus initiates transcription of said regulator gene.

38. (previously presented): A method according to claim 37 wherein said second inducible promoter is a tetracycline inducible promoter or an ecdysone-inducible promoter.

39. (previously presented): A method according to claim 37 wherein said exogenous stimulus is tetracycline, ponasterone, dexamethasone, a heavy metal ion or heat.

40. (previously presented): A method according to claim 25 wherein said step of inducing expression of said target membrane receptor is initiated by the presence or absence or a regulator or by the presence or absence of an inducer.

41. (previously presented): A method for screening a chemical compound library to identify a G-protein coupled receptor modulator molecule, comprising:

a. obtaining a cell that conditionally expresses a G-protein coupled receptor;

b. inducing expression of said G-protein coupled receptor;

c. measuring a physiological parameter associated with said G-protein coupled receptor to obtain a first set of data;

d. incubating a potential modulator of said G-protein coupled receptor with said cell;

e. measuring said physiological parameter to obtain a second set of data; and

f. comparing said first set of data with said second set of data to determine whether said physiological parameter has been modulated, thereby identifying a chemical compound that modulates a G-protein coupled receptor.

42. (previously presented): A method according to Claim 41 wherein said physiological parameter is selected from the group consisting of a cAMP level, a calcium level, and a membrane potential of said cell.

43-52 (canceled).

Conclusion

Applicant has elected restriction Group I and respectfully requests that claims 1 through 42 be examined in the above-identified patent application and that claims 43 through 52 be canceled.

Respectfully submitted,

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